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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,344	05/11/2009	Hideki Nakamura	1086	2701

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EXAMINER	
PATEL, DEVANG R	
ART UNIT	PAPER NUMBER
1735	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,344	NAKAMURA ET AL.	
	Examiner	Art Unit	
	DEVANG R. PATEL	1735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-18* is/are pending in the application.

4a) Of the above claim(s) *7-10 and 15-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 7-10, drawn to a reflow furnace comprising a heater.

Group II, claim(s) 11-14, drawn to a heater comprising a box-shaped body.

Group III, claim(s) 15-18, drawn to a heater comprising a box-shaped body having a first end and a second end, an inlet at the first end communicating with the suction chamber, two outlets at the first end, wherein area of two outlets is larger than area of the inlet, and two partitions sloping towards each other as claimed.

The following is a common technical feature of Groups I-III above: A heater comprising a box-shaped body, two partitions which divide the body into a suction chamber and discharge chambers on opposite sides of the suction chamber, a heater, a blower and a perforated plate having discharge holes. Yokota (JP-11-204932-A) discloses a heater including the common features of: box-shaped body 6, at least two partitions which divide the body into a suction chamber (8c) and discharge chambers 11 on opposite sides of the suction chamber 2, a heater, a blower 7 and a perforated plate 1 having discharge 1a hole (figs. 2-3; ¶ 21-24; 28-30). Hence, Groups I-III above lack a special corresponding technical feature under PCT Rule 13.2 and claims fail to form a

single general inventive concept. Therefore, unity of invention is lacking and restriction is proper.

Newly submitted claims 15-18 directed to an invention that lacks unity with the invention originally claimed for the reasons explained above.

Since applicant has received an action on the merits for the originally presented invention (claims 11-14), this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 15-18 are withdrawn from consideration as being directed to a nonelected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 11-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi (JP-08-125327-A) in view of Kondo (US 4938410), and further in view of Mizoguchi et al. (US 5567151).

a. **Regarding claim 11, Takahashi** discloses a heater 1 (fig. 2) blowing hot air comprising a box-shaped body, an electric heater 7 inside the body, two partitions 2 which divide interior of the body into a suction chamber 3 and discharge chambers 8 on opposite sides of the suction chamber. Each partition includes an opening which connects the suction chamber with one of the discharge chambers (bottom portion). There is a blower 6 installed in a lower

portion of the suction chamber 3 and an upper end of each discharge chamber having slanted plates provides hot air discharge (¶ 22-28).

b. Takahashi does not teach the partitions 2 sloping towards each other. However, **Kondo** (also drawn to reflow heater apparatus) discloses partition plates (inner walls 8b or 9b or 10b) sloping towards each other within the heating chambers (figs. 2-3). The partition walls provide return inlet flow passages (14, 15, 16) and separate the suction chamber from the discharge chamber and thus, such partition plates retain the heated air in a predefined space (col. 7, lines 10-47). Kondo also discloses sloping partition plates 12a between heaters 11 within the inner chamber. It would have been obvious to a person of ordinary skill in the art at the time of the invention to provide sloping partitions in the heater of Takahashi since such is an art-recognized alternative of providing partitions in a reflow heater. The claim would have been obvious because a particular known technique (sloping partitions) was recognized as part of the ordinary capabilities of one skilled in the art (Kondo) and would have only yielded predictable result of directing and discharging heated air in desired areas in the reflow heater of Takahashi. Thus, Takahashi as modified by Kondo includes partitions sloping towards each other at an upper end of the suction chamber and reducing a width of the suction chamber.

c. Takahashi teaches slanted plates having discharge spaces therebetween, but does not teach a perforated plate having discharge holes. However, such discharge plate is well-known in the art. **Mizoguchi** is directed to reflow furnace

having hot air blowing plate and teaches a perforated plate 15 having multiple discharge holes 17 (fig. 3). Similar to Takahashi, Mizoguchi also discloses slanted directional flow plates 18. Mizoguchi teaches that such blowing outlet structure provides uniform heating of the circuit board (col. 4, line 58 thru col. 5, line 24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the slanted plates of Takahashi so as to provide a discharge plate similar to Mizoguchi in order to provide uniform heating of the substrate (Mizoguchi). Moreover, the claim would have been obvious because the substitution of one known element for another (discharge blow plate) would have yielded predictable results to one of ordinary skill in the art.

d. As to claim 12, Takahashi as modified by Mizoguchi includes a separate perforated plate for each discharge chamber on opposite sides the suction port.

e. As to claim 13, Mizoguchi discloses the perforated plate surface covered with ceramic (col. 4, line 64). Mizoguchi further states that the ceramic surfaces of the blowing outlets radiate infrared radiation and multiplies heating effect to provide even, uniform heating of the circuit board (col. 5, lines 55-59). Hence, it would have been obvious to a person of ordinary skill in the art at the time of the invention to coat the perforated plate with a black ceramic in the heater of Takahashi in order to provide improved and uniform heat distribution.

f. As to claim 14, Takahashi as modified by Kondo includes a suction opening formed in the upper end of the body and communicating with the suction

chamber, wherein the area of the suction opening is smaller than the area of the upper end of each discharge chamber due to slanted partitions.

Response to Amendment and Arguments

Applicant's arguments filed 9/23/10 have been fully considered but they are not persuasive. New claims 15-18 have been withdrawn from consideration as being directed to a non-elected invention as explained above.

With respect to claim 11, Applicant argues that sloping partition plates 12a of Kondo does not suggest imparting a slope to the partitions 2 of Takahashi because plates 12a perform a totally different function from the partitions 2 of Takahashi.

In response, the Examiner has changed the interpretation of Kondo with respect to sloping partitions in Kondo thereby necessitating a second Non-Final. In addition to plates 12a, Kondo teaches sloping partition walls (inner walls 8b, 9b) which separate the suction chamber from the discharge chamber, retaining the heated air in a predefined space. Thus, the sloping partition walls 8b/9b/10b of Kondo perform the same function as the partitions 2 of Takahashi. Figs. 2-3 of Kondo were cited to show that it is known in the art to provide sloping partitions to direct air in pre-defined areas in a reflow heater. In view of that, one of ordinary skill in the art would have provided sloping partitions in Takahashi. The claim would have been obvious because a particular known technique (sloping partitions) was recognized as part of the ordinary capabilities of one skilled in the art (Kondo) and would have only yielded predictable

result of directing and discharging heated air in desired areas in the reflow heater of Takahashi.

Applicant further argues that the direction in which the partition plates of Kondo slope is significant - they converge towards upstream, away from the outlets of chamber 8. Thus, if Takahashi were to be modified so that the partitions 2 are sloped, a person of ordinary skill in the art would conclude that the partitions 2 would necessarily have to slope so as to converge towards end of the heater 1, away from the outlet.

In response, Examiner contends that Kondo does not specifically discuss or emphasize the sloping direction of the partition plates. Applicant has imparted significance to the sloping direction so as to limit the sloping and construe partitions of Takahashi in an opposite direction. From another perspective, Kondo shows the partitions sloping in a direction away from the heaters 11a/11b/11c (fig. 2), and accordingly, one of ordinary skill in the art would conclude that the partitions 2 of Takahashi should be sloped away from the heaters 7- i.e. sloping near outlets 8 (fig. 2). Therefore, Examiner submits that the sloping direction in Kondo is not critical in a sense that it should slope away from the outlet as alleged by Applicant. Rather, the sloping direction is subject to relatively different interpretations. However, such disclosure does not undermine the fact that one of ordinary skill in the art would slope the partitions. An artisan would have been motivated to modify partitions 2 of Takahashi to provide sloping in order to direct the air flow in desired areas. More importantly, Examiner notes that claim 11 recites: *"the partitions sloping towards each other at an upper end of the suction chamber",* and so, it does not specify the sloping direction with respect to inlet or

outlet. Hence, even if one of ordinary skill in the art were to slope the partitions 2 of Takahashi away from the outlet as argued by Applicant, the top heaters above the conveyor in Takahashi (fig. 1) would still meet the claim.

Conclusion

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Applicant is reminded to specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. 1.121; 37 C.F.R. Part 41.37; and MPEP 714.02.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVANG PATEL whose telephone number is (571)270-3636. The examiner can normally be reached on Monday thru Thursday, 8:00 am to 5:30 pm, EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEVANG R PATEL/

Examiner, Art Unit 1735

/Jessica L. Ward/

Supervisory Patent Examiner, Art Unit 1735